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LETTER OF TRANSMITTAL

To:

Chief, Rules and Directives Branch
Division of Administrative Services,
Office of Administration
U.S. Nuclear Regulatory Commission
Mail Stop T6-D59
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Date: August 18, 2004

Re:

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We are sending you the following items:

QTY	DATE	DESCRIPTION
1	8/18.2004	Preliminary comments on draft generic operability guidance

Remarks:

The enclosed comments are in response to the August 3, 2004, Federal Register page 46599 notice. The notice title is "Proposed Generic Communication; Draft Revision to NRC Inspection Manual Chapter 9900, 'Technical Guidance, Operability Determinations and Resolution of Nonconformances of Structures, Systems and Components.' These comments are preliminary comments to support the request for comments prior to the August 25, 2004 workshop.

By: Larry Grime

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Draft Comments on the Draft NRC Inspection Manual Chapter 9900, "Technical Guidance, Operability Determinations and Resolution of Nonconformances of Structures, Systems and Components"

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These comments were drafted to support submittal in advance of the August 25, 2004, workshop. My comments are written from the perspective of a licensee that wishes to fully comply with the RIS. Several comments are interrelated. Discussing these and other comments in the workshop can provide a basis to provide refined comments.

Summary:

1. The RIS should make it clear that in some cases prompt operability determinations will receive additional analysis

2. The RIS as written imposes additional requirements on compensatory actions to enhance safety as well as those that restore operability. I know of no regulatory basis for the additional requirements on voluntary actions that enhance safety, and the requirements could tend to discourage such safety improvements.

3. Although previously stated as being 'off limits' for changes, the PRA discussion reveals some inconsistencies within the draft RIS. The guidance should correct this and take the opportunity to recognize potential valuable probabilistically based analysis.

4. The RIS should not use the term 'Specified Function(s).' The Section 3.5 definitions make it clear that some specified functions are not safety functions, but requires an SSC that cannot perform its specified functions be declared inoperable.

5. The new Section 5.8, "Documentation," needs to make it clear that not all operability determinations require documentation. Determinations that an SSC is inoperable should require no operability related documentation. In some cases the immediate determination should be the final determination.

6. The Section 4.4, "Fully Qualified" discussion could represent an unintended change in the qualification concept. The table in this section should have revisions to clarify margin treatment.

7. Simplify Section 5.5, "Circumstances Requiring Operability Determinations" by limiting the need for an operability determination to degraded and nonconforming conditions.

Issue Discussion and Recommendations:

1. The RIS should make it clear that in some cases prompt operability determinations will receive additional analysis

The strict prompt operability determination completion time requirements limit licensees' ability to properly address relevant issues and complete confirmatory analysis. The scope Section 5.6 and Draft Assistance Navigator identifies 17 items that the prompt determination must address. Several of these are compound items that suggest a prompt operability determination may need to address 20 or more items. The topics

include vastly different information that one individual may not be able to address without collaboration with others.

The Assistance Navigator hints at determinations that require 'evaluation ongoing, continuous and proceeding towards a final resolution,' but Section 5.3 states 'In all cases, the operability determination should be completed within the time frames discussed above.'

As an example, a licensee discovers that a support system is degraded to less the accident analysis input value. A cognizant engineer determines within 24 hours that the reduction is extremely unlikely to impact the analysis results, but recommends rerunning the analysis to verify various scenarios. The analysis requires vendor support and normally takes two weeks or longer for the analysis and reviews. Is this considered analysis proceeding towards a final resolution? As written the RIS pressures the licensee to make the final call without rerunning the analysis.

The RIS must make it clear that 'Reasonable Expectation' applies to both immediate and prompt determinations. This could be with a simple statement to that effect, or with a new section to discuss 'Final Determinations.'

Although it is not discussed, the nonconforming condition example related to operating experience properly notes that the nonconformance starts when the licensee determines that they have a design inadequacy, not necessarily when they receive industry information suggesting the inadequacy may exist. The operating experience program should take responsibility for expediting the analysis to demonstrate if the design inadequacy exists.

2. The RIS as written imposes additional requirements on compensatory actions to enhance safety as well as those that restore operability: I know of no regulatory basis for the additional requirements on voluntary actions that enhance safety, and the requirements could tend to discourage such safety improvements.

The guidance should recognize at least three compensatory action classifications compensation to restore operability, compensation to reduce safety significance and enhance safety or unit performance. The first two compensation classification should be within the RIS scope. I know of no regulatory basis to include the third classification within the RIS scope.

Many licensees prefer to perform analysis of temporary alterations using 10 CFR 50.65(a)(4) instead of 10 CFR 50.59. Often the temporary alteration will support maintenance and restore operability. The requirement to apply 10 CFR 50.59 to all compensatory measures serves as a disincentive to licensees to implement compensatory actions that go beyond those needed to establish operability and the anticipated degraded on nonconforming condition duration.

The compensatory action discussion implies that all compensatory actions are inferior to the as licensed condition. This may be true in many cases, but there also may be many cases where the compensated configuration is fully equal or even superior to the as licensed condition from a nuclear safety perspective. Contrary to the RIS suggestion, compensatory actions may be taken because the situation can be improved through such actions or such actions are the logical action needed to support the corrective maintenance as well as compensate for the degradation.

The regulatory needs related to compensatory actions are to assure licensees avoid using operability as a basis to 'shortcut' their normal change evaluation process and to clarify that the evaluation focus is on the effects of the compensatory actions, not the degraded or non-conforming condition.

This example emphasize the importance of encouraging versus discouraging compensatory actions. A containment isolation valve in a line needed for unit production purposes but not for nuclear safety is slightly degraded with regards to its ability to change positions. The licensee could leave the valve shut and accept the production disadvantage or perhaps justify that the valve is operable but degraded. If the valve is left shut, they would need to revise a procedure. Under the proposed guidance, this would trigger a 10 CFR 50.59 screen. That could easily be more 'hassle' than the less conservative approach to perform an operability determination to leave the valve in service.

Recommended Change:

7.3 Compensatory Measures
When evaluating the impact of a degraded or nonconforming condition on plant operation, a licensee may decide to implement a compensatory measure as an interim step to enhance the capability of SSCs until final corrective actions to resolve the conditions are completed. Compensatory measures may be considered when enhancing the status of SSCs that have been determined to be operable but degraded or nonconforming, or as an interim step when restoring
SSCs to operable status.

Compensatory measures for degraded or nonconforming conditions for SSCs that have been determined to be operable but degraded are usually implemented to restore plant operating margins (see Section 4.4). **Compensatory measures may also be used to establish or restore SSCs to an operable status.** A " reasonable time frame" for completing corrective actions should be established in accordance with a licensee's corrective action process as discussed in Section 7.2. **Although compensatory actions may support additional corrective action process time by reducing the operability challenge safety significance, the compensatory action may also suggest a need for quicker corrective action. This is true** ~~Compensatory measures may also be used to establish or restore SSCs to an operable status. In general, these measures should be relatively simple to implement and have minimal operator or plant impact. In addition, the NRC expects that licensees will more quickly resolve degraded or nonconforming conditions using these compensatory measures. The reason for the greater emphasis is because reliance on such remedial measures suggests a greater degree of degradation,~~ particularly if operator action is relied on in place of automatic actions. Use of manual actions in place of automatic actions is discussed further in Appendix C. 5 to this guidance.

The impact of the compensatory measures themselves on the plant should be considered by licensees. The approved regulatory guidance (Regulatory Guide 1.187, endorsing NEI 96- 07, Revision 1) for implementing the revised 10 CFR 50.59 rule states:

> "If an interim compensatory action is taken to address the condition and involves a temporary procedure or facility change, 10 CFR 50.59 should be applied to the temporary change. The intent is to determine whether the temporary change/

compensatory action itself (not the degraded condition) impacts other aspects of the facility or procedures described in the UFSAR."

As discussed in the Regulatory Guide 1.187 endorsed guidance, another regulation may apply to the temporary procedure or facility change instead of or in addition to 10 CFR 50.59. For example a compensatory action that support maintenance and impacts a degraded condition may be evaluated under 10 CFR 50.65(a)(4) if the compensatory action will remain in effect for less than 90 days.

In considering whether a compensatory measure may affect other aspects of the facility, a licensee should pay particular attention to ancillary aspects of the compensatory measure that may result from actions taken to compensate for the degraded condition. For example, a licensee may plan to close a valve as a compensatory measure to isolate a leak. Although that action would temporarily resolve the leaking condition, it may also affect flow distribution to other components or systems, complicate required operator responses to normal or off normal conditions, or have other effects that should be evaluated in accordance with 10 CFR 50.59 before the compensatory measures are implemented.

3. Although previously stated as being 'off limits' for changes, the PRA discussion reveals some inconsistencies within the draft RIS. The guidance should correct this and take the opportunity to recognize potential valuable probabilistically based analysis.

This section raises several concerns:

a. The statement that "the inherent assumption is that the occurrence conditions or events exists and that the safety function can be performed." Conflicts with accepted practice and examples in the draft RIS.

   Section C.9 "Support System Operability" states "a ventilation system ... may not be required in the winter" and "the electrical power supply for heat tracing ... may not be required in the summer." In practice this concept has also been applied to other weather related events such as hurricanes, tornadoes and flooding. My two concerns are the conflict and the prohibition on use of PRA when making such decisions.

   A responsible licensee taking credit for the external temperature to support an operability determination will likely be able to calculate the external temperature at which operability is called into question. To avoid relying on operators to detect the unacceptable temperature condition and declare the support system inoperable, the licensee desires assurance that during the anticipated degraded condition, the temperature will not reach the unacceptable temperature. Such analysis will very likely include probabilistic techniques. This would be using probability of occurrence of an external event.

b. Use of PRA should be encouraged for some operability related decisions. If the degraded component would tend to increase the probability of an accident if it failed, quantifying the increased accident probability should be encouraged versus prohibited. Lacking specific criteria for such operability situations, a calculated result that would meet the 10 CFR 50.59 criteria for increased accident frequency should be free from a challenge to their use of engineering judgment supported by a calculation.

The use of the broad term 'decisions' versus narrower 'determinations' implies that it would be unacceptable for a licensed operator or unit management to even ask or in any way discuss a statistical issue related to a decision when reviewing an operability determination.

c. Although the time limits for completing operability determinations often will not support detailed probabilistic-based analysis, having some link to probabilistic based criteria can help support engineering judgment. For example, a 10 CFR 50.59 criterion considers a component change 'less than minimal' if the component failure likelihood increase is less than doubled. When evaluating reliability challenges in operability determinations, the engineering judgment on the failure likelihood increase should be permitted to refer to this criterion without fear that the determination will be challenged for using probability. For example, it could conclude that the increase in failure likelihood would be much less than doubled and could easily pass criteria for being left permanently at the higher failure rate.

Recommended change:

C. 6 Use of Probabilistic Risk Assessment in Operability Decisions
Probabilistic risk assessment (PRA) is a valuable tool for the relative evaluation of accident scenarios while considering, among other things, the probabilities of occurrence of accidents or external events. The definition of operability states, however, that the SSC must be capable of performing its specified safety function(s). The inherent assumption is that the occurrence conditions or event exists and that the safety function can be performed. ~~The use of PRA or probabilities of the occurrence of accidents or external events is not acceptable for making operability decisions.~~ **The use of PRA or probabilistic approaches to determine the probabilities of the occurrence of accidents or external events during a period when an SSC's operability is challenged has limited applicability for making operability decisions.**

Acceptable use of probabilistic approaches include:

- **Quantifying potential accident frequency increases due to a degraded or nonconforming SSC.**
- **Determining the increased failure likelihood for SSCs at risk of increased failure.**

When determining potential accident frequencies and malfunction likelihoods the no more than minimal criteria from NEI 96-07, Revision 1, may be used, however, the anticipated operability challenge duration may not be considered.

- **Determining the likelihood of external events such as highest temperature or tornado likelihood during the degraded or nonconforming period.**

~~However,~~ PRA may provide valid and useful supportive information for a license amendment as part of corrective actions. The PRA is also useful for determining the safety significance of SSCs. The safety significance, whether determined by PRA or other analyses, is a necessary factor in decisions on the appropriate " timeliness" of operability determinations. Specific guidance on the timeliness of determinations is presented in Section 5.2.

4. The RIS should not use the term 'Specified Function(s).' The Section 3.5 definitions make it clear that some specified functions are not safety functions,

but requires an SSC that cannot perform its specified functions be declared inoperable.

I know of no regulatory basis to require that all specified functions as defined in the draft RIS would require an inoperable declaration. If the function is a safety function, the inability to perform the function should mean the SSC is degraded and if there is no alternate acceptable means to accomplish the function the affected SSCs would be inoperable. For specified functions that are not also safety functions, there need to be a regulatory requirement for the function before the RIS should apply.

The recommended solution is to only define the term safety function and to make it clear that references to function throughout the document refer to a safety function.

The statement about a reliability reduction triggering an operability determination should be characterized as a degraded condition example.

5. The new Section 5.8, "Documentation," needs to make it clear that not all operability determinations require documentation. Determinations that an SSC is inoperable should require no operability related documentation. In some cases the immediate determination should be the final determination.

When a component fails and is declared inoperable a documented operability determination should not be required. Sections 5.5, 5.6 and 5.8 should make this clear. The RIS should also make it clear that some operability determinations can be final based on the immediate determination. Some licensees may document some operability determinations in condition reports and reserve separate documentation only for operability determinations requiring extensive engineering or licensing input. The RIS should recognize that operability determinations may take various forms and have different content.

Since the specific condition rather than the fact that operability was called into question determines the extent of the operability determination, the industry should not rely on operability determinations to determine the condition extent. Every SSC failure, degradation or nonconformance could raise a condition extent concern, but not all situations will have an operability determination. The condition recognition program is a proper place to capture extent of condition concerns. Licensees may at their option resolve such concerns in one operability determination or use a separate process for the other SSC that may be at risk.

6. The Section 4.4, "Fully Qualified" discussion could represent an unintended change in the qualification concept. The table in this section should have revisions to clarify margin treatment.

The discussion adds considerable emphasis to margin. Since margin 'ownership' is often confused in practice, I suggest the table always use the term 'required margin' when referring to margins that trigger operability determinations if not met. I suggest deleting the table row that refers to margin. The emphasis should be on the ability of the SSC to perform its safety function. It's not clear what margin this refers to. The row implies that a degradation that cuts into the margin, but does not reach the failure point can always be considered operable or functional but degraded. While this may be true for nearly all cases that refer to conservatism added by a licensee, it is much less likely to be true for all instances of a reduction in a margin required by regulation, tech specs or a licensee commitment.

The transition from conservatism added by the licensee to the required margin is an example of the degraded condition threshold. However, there could be rare cases where the SSC demonstrates an unexpected decline rate that potentially affects operability or functionality even though it has not yet degraded below the required margin.

One full qualification perspective is that an SSC need not be operable to be fully qualified. This is partially based on the discussion in GL 91-18, Rev. 0, Section 5.3, "Deal with Operability and Restoration of Qualification Separately." For example, if the diesel generator is taken out of service for corrective maintenance, preventative maintenance, testing, or if a required support safety function is not available, the diesel generator is inoperable. However, the diesel generator has not lost its qualification.

This perspective would even consider components that fail and are declared inoperable pending corrective maintenance be considered to remain fully qualified. This 'Full Qualification' refers to the SSC pedigree not its current condition. Operable and inoperable refers to the current condition. For the guidance the term to use here might be 'Fully Operable' or 'Unconditionally Operable.'

The other perspective is that 'Full Qualification' describes SSCs that are operable with no degradation or nonconformance in any way threatening that operability. This appears to be the intended definition in the draft RIS.

Whichever, perspective is intended should be made clear.

There are seven possible states of operability:

1. Operable with no degradation or nonconformance (The second full qualification perspective would say this is full qualification.)
2. Degraded but operable
3. Nonconforming but operable
4. Degraded and nonconforming but operable
5. Degraded and inoperable
6. Nonconforming, nonconforming and inoperable
7. Degraded, nonconforming and inoperable

Recommended change:

4.4 Fully Qualified
An SSC is considered fully qualified when it conforms to all aspects of its CLB, including meeting all applicable codes and standards, design criteria, safety analyses assumptions and specifications, and licensing commitments. Operation with fully qualified SSCs ensures that safety margins are maximized.
The table below illustrates the terminology used to describe the status of SSCs when degraded or nonconforming conditions are identified and evaluated. Operable refers to SSCs that are in TS and functional refers to those SSCs that are not in TS. For SSCs not in TS, the assessment of functionality and the resolution of degraded or nonconforming conditions are part of an effective licensee problem identification and corrective action program.

State of Qualification	SSCs in plant TS	SSCs not in TS

Fully Qualified	Operable	Functional
~~Condition exists, but only affects margin~~	~~Operable but degraded~~	~~Functional but degraded~~
Condition exists affecting **specified safety** function(s), but SSC determined able to perform **the** function	Operable but degraded **or nonconforming**	Functional but degraded **or nonconforming**
Condition exists affecting **specified safety** function(s), but SSC determined not able to perform **the** function	Not Operable	Not Functional

The SSCs defined in Section 2 are designed and operated, as described in the CLB, to include design margins and engineering margins of safety to ensure, among other things, that some loss of quality does not mean immediate failure. The CLB includes commitments to specific codes and standards, design criteria, and some regulations that also dictate margins. Many licensees add conservatism so that a partial loss of quality does not affect their commitments to the margins.

The loss of conservatism not taken credit for in the safety analyses and not committed to by the licensee to satisfy licensing requirements does not require a system to be declared inoperable. **When non-credited conservatism losses are expected during normal plant operation, such losses are not considered degraded conditions. For example, a pump with declining capacity due to wear becomes degraded when its capacity decline could affect operability or functionality. A pump that fails to meet a capacity requirement must be considered degraded. A pump showing a declining trend that has the potential to reduce its capacity below the capacity requirements before the next surveillance should also be considered degraded. However, if the decline in capacity is consistent with the assumptions considered in testing and maintenance programs, the pump remains operable.** ~~All other losses of quality or margins are subject to a prompt operability determination and corrective action.~~

7. Simplify Section 5.5, "Circumstances Requiring Operability Determinations" by limiting the need for an operability determination to degraded and nonconforming conditions.

These definitions now include the phrase 'potentially affecting operability or functionality.' This is a needed improvement. I noticed a minor confusion risk with the terms as used in Section 5.5. The reference to these conditions adds 'where performance or qualification is called into question.' This implies that not all situations that meet the degraded or non-conforming condition definition require an operability determination.

Recommended change in Section 5.5:

- Discovery of degraded conditions ~~of equipment where performance is called into question~~.

- Discovery of nonconforming conditions ~~where the qualification of equipment (such as conformance to codes and standards) is called into question~~.

The other bulleted items in this section can be cited as examples of degraded and nonconforming conditions. As noted previously, this section should also make it clear that not all degraded and nonconforming conditions require a documented operability determination.